Description

Localization of telephone subscribers connected to a packet
network

The invention relates to a method for locating a telephone
terminal in the case of a voice connection conducted via a
packet network.

The invention lies in the field of switching technology and
relates in particular to the provisioning of service features
for voice communication via packet networks.

A side-effect of the rapid development of packet-based
networks, including in particular the networks based on the IP
(Internet Protocol) protocol, is that real-time traffic, such
as e.g. voice traffic, is increasingly being handled via packet
networks in addition to the data traffic. At the same time
efforts are being directed at providing all the service
features that are known from telephony via circuit-switched
networks (also referred to in this context as TDM (Time
Division Multiplexing) networks) as far as possible also for
voice communication via packet networks.

A service feature known from TDM networks is the localization
of telephone subscribers on the basis of their call numbers.
Originally the call numbers were chosen so that the position of
the corresponding terminal or telephone subscriber could be
deduced on the basis of the composition of said numbers. In the
meantime this rigid link has been abandoned, at least in the
German network, in favor of service features such as a
subscriber-related instead of location-related number
assignment. In today's TDM networks the localization is
normally performed by means of localization information which

is assigned to a call number. This localization information is typically stored in switching systems for terminals controlled by the respective switching system. The localization information can then be queried or the localization performed

5   via the switching system.

This function, i.e. the localization of terminal devices, is currently not available for terminals that are connected directly to a packet network, e.g. so-called IP telephones,

10   which is to say telephones that send their voice data directly by means of the IP protocol and exchange signaling using, for example, the SIP protocol, or PCs equipped with voice functionality.

15   The object of the invention is to specify a method for locating telephone terminals which also permits the localization of telephone terminals connected directly to packet networks.

This object is achieved by a method according to claim 1.

20

According to the invention a server is provided in which telephone subscribers are registered together with their call number and localization information assigned to the call number. In a voice connection in which the calling subscriber

25   is to be identified, in the case of an emergency call for example, the localization of the calling telephone terminal is initiated during the voice connection (in the course of the connection setup, for example). In the course of said localization the call number of the calling telephone terminal

30   is used in a query to the server to interrogate the localization information assigned to the call number. Finally, the position of the calling telephone terminal is determined on the basis of said localization information.

The method according to the invention is advantageous in particular with regard to telephone terminals connected directly to the packet network, such as, for example, IP telephones or PCs equipped with voice functionality.

5

In the event that the subscriber called in the course of the voice connection is connected to a circuit-switched network or TDM network, the query to the server can be initiated in the switching system controlling the calling terminal. This query

10 is then transmitted to the server in which the localization information is stored. The call number of the calling telephone terminal can then be sent to the called terminal or a switching system responsible for said terminal using, for example, e-mail, SMS or fax.

15

During the registration of the telephone terminal the packet network address of the telephone terminal can additionally be stored in the server. This additional information can be used, for example, for checking the consistency of the information

20 stored in the server.

The subject matter of the invention will be explained in more detail below in the context of an exemplary embodiment with reference to a figure.

25

The figure shows an IP telephone IP-Tln which is connected to an IP network IPNET. A server SER for registering telephone terminals is provided in said IP network IPNET. The server SER is operated for example by an internet service provider. The

30 user of the IP telephone IP-Tln is registered with the server SER. In this case the registration can be one actively undertaken by the user of the IP telephone IP-Tln or an automatic registration. The figure illustrates a scenario for the situation in which the called subscriber is a PSTN (Public

4

Switched Telephone Network) subscriber, i.e. a subscriber
connected to the PSTN network via a local exchange Vst. In a
voice connection between the IP telephone IP-Tln and the
telephone of the called subscriber B-Tln the exchanged data

5   must be adapted for the transmission over different networks.
Said adaptation is performed in a gateway GW which adapts data
coming from the IP network IPNET for the transmission over the
PSTN network PSTN and similarly adapts data going in the
opposite direction. According to the invention the position of

10 the IP telephone IP-Tln is located. The called subscriber B-Tln
is, for example, an emergency call center. During the
connection setup a connection setup message is transmitted from
the IP telephone IP-Tln to the called terminal B-Tln. Upon
receiving the connection setup message, the local exchange VST

15 of the called subscriber B-Tln establishes that a connection to
the emergency call center B-Tln is to be set up, but that the
information regarding the position of the calling subscriber
or, as the case may be, IP telephone IP-Tln, which information
is to be determined when calls are made to the emergency call

20 center, is not available. In the local exchange VST the
localization of the calling subscriber or, as the case may, the
latter's terminal IP-Tln is thereupon initiated. Toward that
end, a message is sent to the server SER, by means of which
message the desired information is queried on the basis of the

25 call number of the calling subscriber IP-Tln. A message of said
kind is transmitted back via the PSTN network to the gateway GW
and adapted there for transmission via the IP network IPNET.
The following options, for example, are possible with regard to
reaching the server SER by means of the message.

30

• The message for querying the desired localization
  information using the call number of the calling
  subscriber IP-Tln is first transmitted to the IP

telephone IP-Tln and forwarded from there to the server
SER.

- Alternatively, multicast can be used, for example, in
  order to propagate the message to possible destinations
  through the network. The message will then be discarded
  by all recipients except the server SER. It can be
  provided, for example, that a server SER for registering
  telephone terminals is provided for each subnetwork. In
  this case a multicast can be performed for the
  corresponding subnetwork.

- It is also conceivable that the addresses of servers SER
  which store the localization information for terminals
  connected directly to the IP network are made available
  (when a server SER of said kind is set up, for example)
  to subscribers or terminals that generally require the
  localization information, such as, for example,
  emergency services or emergency call centers, so that
  the called subscriber B-Tln already has the server
  address.

Upon receiving the message requesting the transfer of the
localization information, the server SER sends said
localization information, possibly together with the telephone
number of the calling subscriber A-Tln (in the interest of
better control), to the called subscriber B-Tln or the
associated local exchange VST. This can happen in that this
information is first transmitted via the IP network IPNET, then
adapted in the gateway GW, and finally transmitted via the PSTN
network PSTN to the destination, where the information is
analyzed and the position of the calling subscriber IP-Tln
determined.